

FORMALDEHYDE-FREE ADHESIVES AND LIGNOCELLULOSIC COMPOSITES
MADE FROM THE ADHESIVES

ABSTRACT

A first variant of an adhesive composition for making a lignocellulosic composite includes soy protein and/or lignin; at least one substantially formaldehyde-free curing agent that includes at least one amine, amide, imine, imide, or nitrogen-containing heterocyclic functional group that can react with at least one functional group of the soy protein; and at least one compound selected from a boron compound, a group IA oxide or hydroxide, or a group IIA oxide or hydroxide. A second variant of an adhesive composition includes a first component selected from soy protein and/or lignin; and at least one substantially formaldehyde-free curing agent selected from a reaction product of epichlorohydrin with ethylenediamine, a reaction product of epichlorohydrin with bis-hexamethylenetriamine, or a reaction product of epichlorohydrin with hexamethylenediamine.